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EXAMINER	
CONNELLY CUSHWA, MICHELLE R	
ART UNIT	PAPER NUMBER
2874	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/766,680	BHATIA, VIKRAM	
	Examiner	Art Unit	
	Michelle R. Connelly-Cushwa	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/27/04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Six (6) sheets of formal drawings were filed on January 27, 2004 and have been accepted by the Examiner.

Specification

The disclosure is objected to because of the following informalities: the brief description of Figure 4 is incorrect.

Appropriate correction is required.

Claim Objections

Claim 6 objected to because of the following informalities: -- first—should be inserted after "into at least the" in line 3 of claim 6. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5, 6, 8, 12, 13, 21 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Connolly (US 6,614,569 B2).

Regarding claims 1 and 8; Connolly discloses a method of and an optical apparatus for filtering a plurality of multiplexed channels (λ1, λ2, λ3, λ4, λ5, λ6) having a first adjacent channel spacing, the plurality of multiplexed channels including at least a first sub-plurality of multiplexed channels (λ1, λ3, λ5) having a second adjacent channel spacing greater than the first adjacent channel spacing and a second sub-plurality of multiplexed channels (λ2, λ4, λ6) having a third adjacent channel spacing greater than the first adjacent channel spacing (see Figure 1 and column 1, lines 27-42), the optical apparatus comprising:

- a first set of one or more thin film filters (16, 17), each thin film filter of the first set of one or more thin film filters having no less than a first transmitted dispersion magnitude and having not more than a first reflected dispersion magnitude, wherein the first set of one or more thing film filters split the first sub-plurality of multiplexed channels (λ1, λ3, λ5) from the plurality of multiplexed channels; and
- a second set of one or more thin film filters (22, 23), each thin film filter of the second set of one or more thin film filters having no more than a second transmitted dispersion magnitude and having no less than a second reflected dispersion magnitude, wherein the second set of one or more thin film filters split the second sub-plurality of multiplexed channels (λ2, λ4, λ6) from the plurality of multiplexed channels;
- wherein the first transmitted dispersion magnitude exceeds the second transmitted dispersion magnitude.

Regarding claim 2; the limitation "wherein the first transmitted dispersion magnitude, the first reflected dispersion magnitude, the second transmitted dispersion magnitude, and the second reflected dispersion magnitude are worst case magnitudes associated with one or more passbands" does not define structural limitations. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. The prior art device of Connolly meets the claimed structural limitations for the device and is capable of performing the functional limitations of claim 2, i.e. the device of Connolly is capable of producing worst case magnitude for first transmitted dispersion magnitude, the first reflected dispersion magnitude, the second transmitted dispersion magnitude and the second reflected dispersion magnitude. The device of Connolly therefore anticipates the device of the present claim. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Regarding claim 5; the first set of one or more thin film filters (16, 17) is arranged before the second set of one or more thin film filters (22, 23).

Regarding claims 6 and 13; an interleaver (the interleaver is formed by circulators, 12 and 18, and gratings, 14 and 20) splits a plurality of pre-interleaver

multiplexed channels into at least the first plurality of multiplexed channels and the second plurality of multiplexed channels.

Regarding claim 12; the first sub-plurality of multiplexed channels is split from the plurality of multiplexed channels preceding the split of the second sub-plurality of multiplexed channels from the plurality of multiplexed channels.

Regarding claim 21; Connolly discloses a method of and an optical apparatus for filtering a plurality of multiplexed channels (λ1, λ2, λ3, λ4, λ5, λ6) having a first adjacent channel spacing, the plurality of multiplexed channels including at least a first sub-plurality of multiplexed channels (λ1, λ3, λ5) having a second adjacent channel spacing greater than the first adjacent channel spacing and a second sub-plurality of multiplexed channels (λ2, λ4, λ6) having a third adjacent channel spacing greater than the first adjacent channel spacing (see Figure 1 and column 1, lines 27-42), method comprising:

- splitting a plurality of pre-interleaver multiplexed channels (λ1, λ2, λ3, λ4, λ5, λ6) into the first and second sub-pluralities of multiplexed channels (λ1, λ3, λ5 and λ2, λ4, λ6, respectively);
- splitting the first sub-plurality of multiplexed channels (λ1, λ3, λ5) with a first set of one or more thin film filters (16, 17); and
- splitting the second sub-plurality of multiplexed channels (λ2, λ4, λ6) with a second set of one or more thin film filters (22, 23).

The method and device disclosed by Connolly has the ability to perform the claimed functional limitations.

Regarding claim 25; the first sub-plurality of multiplexed channels is split preceding the splitting of the second sub-plurality of multiplexed channels.

Claims 15, 16, 19, 20, 27, 31, 34-36, 40, 43 and 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhong et al. (US 2005/0078909 A1).

Regarding claims 15 and 16; Zhong et al. discloses a method of filtering a plurality of multiplexed channels (λ1-λ8; see Figure 7) having a first adjacent channel spacing, the plurality of multiplexed channels including at least first and second sub-pluralities of multiplexed channels (λ2, λ4, λ 6, λ8 and λ1, λ5 respectively) having second and third adjacent channel spacings, respectively, wherein the second and third adjacent channels spacing are greater than the first adjacent channel spacing, comprising:

- splitting the first sub-plurality of multiplexed channels (λ2, λ4, λ 6, λ8) from the plurality of multiplexed channels with a first set of one or more thin film filters (704), such that after splitting, each of the first sub-plurality of multiplexed channels has no more than a first dispersion magnitude that is substantially attributable to a first transmitted dispersion magnitude of a first set of one or more thin film filters; and
- splitting the second sub-plurality of multiplexed channels (λ1, λ5) from the plurality of multiplexed channels with a second set of one or more thin film filters (712), such that after splitting, each of the second sub-plurality of multiplexed channels has no more than a second dispersion magnitude that is substantially attributable to a first reflected dispersion

magnitude of a first set of one or more thin film filters and a second transmitted dispersion magnitude of a second set of one or more thin film filters;

- wherein the first transmitted dispersion magnitude exceeds the second transmitted dispersion magnitude.

Regarding claim 19; the second and third adjacent channel spacings are different.

Regarding claim 20; the first sub-plurality of multiplexed channels (λ2, λ4, λ 6, λ8) are split preceding splitting the second sub-plurality of multiplexed channels (λ1, λ5).

Regarding claim 27, 31, 34-36, 40, 43 and 44; Zhong et al. discloses an optical apparatus and method filtering a plurality of multiplexed channels (λ1, λ3, λ5, λ7) having a first adjacent channel spacing, the plurality of multiplexed channels including a t least a first and second sub-pluralities of multiplexed channels (λ1, λ5 and λ3, λ7; respectively) having first and second adjacent channel spacings, respectively, that are each greater than the first adjacent channel spacing, comprising:

- a first set of one or more thin film filters (716) that splits the first sub-plurality of channels (λ1, λ5);
- a second set of one or more thin film filters (719) that splits the second first sub-plurality of channels (λ3, λ7);
- wherein first and second dispersion magnitudes of the first and second sub-pluralities of channels are substantially equal;

- wherein the first set of one or more thin film filters is arranged before the second set of one or more thin film filters;
- wherein an interleaver (704, 712) splits a plurality of preinterleaver channels into at least the first and second plurality of channels; and
- wherein the plurality of preinterleaver multiplexed channels (λ1, λ2, λ3, λ4, λ5, λ6, λ7, λ8) have a fourth channel spacing less than the first adjacent channel spacing.

Claims 27 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. (US 6,546,166 B1).

Regarding claim 27 and 36; Liu et al. discloses an optical apparatus (see Figures 1-4) and method for filtering a plurality of multiplexed channels having a first adjacent channel spacing and including first and second sub-pluralities of multiplexed channels having second and third adjacent channel spacing that are each greater than the first channels spacing (see Figure 4; column 4, line 12, through column 7, lines 65), comprising:

- one or more thin film filters (for example, 120 in Figure 1), wherein the first set of one or more thin film filters split the first sub-plurality of multiplexed channels from the plurality of multiplexed channels; and
- a second set of one or more thin film filters (for example, 130 in Figure 1), wherein the second set of one or more thin film filters split the second sub-plurality of multiplexed channels from the plurality of multiplexed channels;

- wherein a first dispersion magnitude of the first sub-plurality of multiplexed channels is substantially equal to a second dispersion magnitude of the second sub-plurality of multiplexed channels.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 4, 9-11 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connolly (US 6,614,569 B2).

Regarding claims 3, 4, 10, 11, 23 and 24; Connolly discloses all of the limitations of these claims as applied above, except for explicitly stating that the second and third adjacent channel spacing are different or equal. One of ordinary skill in the art would have found it obvious to have the second and third channel spacings be any desired spacing, including spacings that are different from or equal to each other, in order to allow the channels to be dropped in any desired order or pattern to efficiently route the data on the signals in an optical system; since Applicant has not indicated that having the channel spacings be different or equal solves any stated problem or is for any particular purpose and it appears that the invention of Connolly would perform equally well regardless.

Regarding claims 9 and 22; Connolly discloses a method as claimed, except for the interleaver dispersion magnitude, the first and second dispersion magnitudes, the

first transmitted dispersion magnitude, the first reflected dispersion magnitude, the second transmitted dispersion magnitude, and the second reflected dispersion magnitude being "worst case magnitudes associated with one or more passbands" does not define structural limitations or method steps. The prior art device of Connolly meets the claimed structural limitations and the claimed method steps and is capable of producing the results defined in claims 9 and 22, i.e. the device of Connolly is capable of producing worst case magnitude for the interleaver dispersion magnitude, the first and second dispersion magnitudes, the first transmitted dispersion magnitude, the first reflected dispersion magnitude, the second transmitted dispersion magnitude and the second reflected dispersion magnitude. Therefore, one of ordinary skill in the art would have found it obvious to use the device and method disclosed by Connolly to produce an interleaver dispersion magnitude, first and second dispersion magnitudes, a first transmitted dispersion magnitude, a first reflected dispersion magnitude, a second transmitted dispersion magnitude and a second reflected dispersion magnitude that are worst case magnitudes associated with one or more passbands in order to achieve desired transmission results.

Claims 7, 14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connolly (US 6,614,569 B2) Liu et al. (US 6,546,166 B1).

Regarding claims 7, 14 and 26; Connolly does not disclose that the plurality of preinterleaver multiplexed channels has a fourth adjacent channel spacing less than the first adjacent channel spacing. However, given the general knowledge available to one of ordinary skill in the art, relating to cascading thin film filters to demultiplex/interleave

optical signals, one of ordinary skill in the art would have recognized the advantages of providing multiple stages of thin film filters in the invention of Connolly. For example, Liu et al. teaches that thin film filters may be providing in multiple stages to obtain the desired output configuration for channels, including interleaving. Therefore, one of ordinary skill in the art would have found it obvious to provide additional stages in the invention of Connolly in order to demultiplex/interleave a larger number of signals, thereby producing an optical device in which the plurality of preinterleaver multiplexed channels has a fourth adjacent channel spacing that is less than the first adjacent channel spacing.

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhong et al. (US 2005/0078909 A1).

Regarding claim 17; Zhong et al. discloses a method as claimed, except for "the first transmitted dispersion magnitude, the first reflected dispersion magnitude, the second transmitted dispersion magnitude, and the second reflected dispersion magnitude" being "worst case magnitudes associated with one or more passbands". These limitations do not define structural limitations or method steps. The prior art device of Zhong et al. meets the claimed structural limitations and the claimed method steps and is capable of producing the results defined in claim 17, i.e. the device of Zhong et al. is capable of producing worst case magnitude for first transmitted dispersion magnitude, the first reflected dispersion magnitude, the second transmitted dispersion magnitude and the second reflected dispersion magnitude. Therefore, one of ordinary skill in the art would have found it obvious to use the device and method

disclosed by Zhong et al. to produce a first transmitted dispersion magnitude, a first reflected dispersion magnitude, a second transmitted dispersion magnitude and a second reflected dispersion magnitude that are worst case magnitudes associated with one or more passbands in order to achieve desired transmission results.

Regarding claim 18; Zhong et al. discloses all of the limitations of these claims as applied above, except for explicitly stating that the second and third adjacent channel spacing are equal. One of ordinary skill in the art would have found it obvious to have the second and third channel spacings be any desired spacing, including spacings that are equal to each other, in order to allow the channels to be dropped in any desired order or pattern to efficiently route the data on the signals in an optical system, since Applicant has not indicated that having the channel spacings be different or equal solves any stated problem or is for any particular purpose and it appears that the invention of Zhong et al. would perform equally well regardless.

Claims 28-30, 32, 33, 37-39, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,546,166 B1).

Regarding claims 28 and 37; Liu et al. discloses a method as claimed, except the first and second dispersion magnitudes being worst case magnitudes associated with one or more passbands. These limitation do not define structural limitations or method steps. The prior art device of Liu et al. meets the claimed structural limitations and the claimed method steps and is capable of producing the results defined in claim 28, i.e. the device and method of Liu et al. is capable of producing worst case magnitude for first and second dispersion magnitudes. Therefore, one of ordinary skill in the art would

have found it obvious to use the device and method disclosed by Liu et al. to produce a first and a second dispersion magnitude that are worst case magnitudes associated with one or more passbands in order to achieve desired transmission results.

Regarding claims 29, 30, 38 and 39; Liu et al. discloses all of the limitations of these claims as applied above, except for explicitly stating that the second and third adjacent channel spacing are different or equal. One of ordinary skill in the art would have found it obvious to have the second and third channel spacings be any desired spacing, including spacings that are different from or equal to each other, in order to allow the channels to be dropped in any desired order or pattern to efficiently route the data on the signals in an optical system, since Applicant has not indicated that having the channel spacings be different or equal solves any stated problem or is for any particular purpose and it appears that the invention of Liu et al. would perform equally well regardless.

Regarding claims 32, 33, 41 and 42; Liu et al. does not disclose that the first and second dispersion magnitude are within 1 ps/nm or within 10 ps/nm of each other. However, it would have been obvious to one of ordinary skill in the art to have the first and second dispersion magnitudes be within 1 ps/nm or within 10 ps/nm of each other to obtain the desired transmission results, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233) and that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Duck et al. (US 5,629,995) ; Scobey (US 5,786,915) ; Zheng (US 6,067,178); Scobey et al. (US 6,658,172); Hou (US 6,678,476 B1); and Hollars et al. (US 2004/0067014 A1) each disclose related inventions.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Michelle R. Connelly-Cushwa
Michelle R. Connelly-Cushwa
Patent Examiner
March 30, 2007